

186 Center Street Suite 290 Clinton, NJ 08809 (908) 735-9315 (908) 735-2132 FAX

November 22, 2013

Stephanie Vaughn U.S. Environmental Protection Agency, Region II 290 Broadway New York, New York 10007-1866 Via Electronic Mail

Re: Model Clarification – Response to USEPA Region 2's October 23, 2013 Letter - Lower Passaic River Study Area (LPRSA) Administrative Agreement and Order on Consent for Remedial Investigation/ Feasibility Study (RI/FS) -CERCLA Docket No. 02-2007-2009

Dear Ms. Vaughn:

The Lower Passaic River Study Area Cooperating Parties Group (CPG) acknowledges receipt of USEPA Region 2's (Region 2) letter of October 23, 2013 (Attachment A). In its letter, Region 2 described its understanding of the relationship between the numeric models being developed by its contractors for the revised Early Action Focused Feasibility Study (FFS) and by the CPG for the Lower Passaic River Study Area (LPRSA) remedial investigation/feasibility study (RI/FS) pursuant to the above-referenced Administrative Order on Consent (RI/FS AOC). While the CPG agrees with many statements presented in this letter (e.g., both the EPA's model and the CPG's model are still being refined), there are several issues on which the CPG is compelled to respond to Region 2 with corrections and clarifications, including:

- The Region's descriptions of the numeric models
- The extent of EPA/CPG collaboration and oversight on the LPR/NB Model being developed pursuant to the RI/FS AOC and 2006 Modeling Work Plan
- The reasons for the different recovery trajectories produced by the FFS model and LPR/NB Model and why the differences are critical
- The purpose and outcome of the September 26, 2013 EPA-CPG Modeling Meeting
- The approach to future modeling meetings

## **Description of the Numeric Models**

In its letter, Region 2 suggests that there are three separate models. Region 2 describes the "FFS Model" being developed and used by EPA's contractor to support the FFS for River Miles (RM) 0-8. EPA then states that the CPG is developing two other models — which Region 2 calls the "17-mile RI/FS Model" (to support remedy selection for the full 17-mile LPRSA) and the "Targeted Remedy Model" (to support the CPG's targeted remedy approach). In reality, there is only one model being developed by the CPG. The CPG's model for the LPRSA also includes the Newark Bay Study Area, and, although

PAPER

S. Vaughn LPR Model Clarification November 22, 2013 Page 2 of 12

it has been referred to by Region 2 as the "17-mile RI/FS model", it is commonly and more accurately referred to as the "LPR/NB Model." The RI/FS AOC requires that the LPR/NB Model follows the Region's 2006 Modeling Work Plan and has been developed under the oversight of the Region; as described herein, the CPG has been doing both. There is no third "Targeted Remedy Model" that differs from the LPR/NB Model, as Region 2 asserts in the first paragraph of its letter. Rather, as Region 2 correctly presumes, in paragraph 5 (sentence 2), the CPG is using a working version of the LPR/NB Model to evaluate a targeted removal alternative.

The CPG has been sharing preliminary modeling results from its working LPR/NB Model in response to requests from the Region, Headquarters and the LPR Community Advisory Group (CAG). This is not a novel approach; in fact, Region 2 first established the precedent of providing the public and other stakeholders with predictions and results of an unreviewed numeric model when it presented its recovery predictions to the CAG on September 18, 2012. Region 2 representatives presented these modeling results well in advance of both the December 2012 National Remedy Review Board (NRRB) meeting and the February/March 2013 Region 2 peer review of the FFS Model.

In addition, Region 2 representatives have stated on numerous occasions to the CPG and other stakeholders (e.g., EPA-CPG Meetings, CAG Meetings, EPA Headquarters—CPG Meetings, etc.) that numeric model predictions are needed in order for the Region to evaluate and compare the efficacy of the CPG's Sustainable Remedy with its FFS alternatives. As a result, the CPG has provided its initial modeling results. As the LPR/NB Model is refined and as EPA's comments on the sediment transport and contaminant fate and transport model components are incorporated, subsequent model runs will be conducted and the results will be updated.

EPA's letter misrepresents the function and application of the CPG's modeling efforts. The working version of the LPR/NB Model has been used to simulate the results of the targeted removal for the entire LPRSA (as reflected in EPA's letter); to simulate the FFS bank-to-bank alternatives for the lower 8 miles; and to simulate a combined remedy consisting of a bank-to-bank remedy for the lower eight miles with a targeted remedy for the upper nine miles of the LPRSA. The CPG has previously shared these modeling results with Region 2 and EPA Headquarters; therefore, the Region should be aware that the CPG is not using the LPR/NB Model solely to simulate recovery for its targeted removal alternative.

## Collaboration and Oversight

As stated in the second paragraph of Region 2's letter, the LPR/NB Model is being developed under the supervision of Region 2 pursuant to the RI/FS AOC. The LPR/NB



S. Vaughn LPR Model Clarification November 22, 2013 Page 3 of 12

Model adheres to Region 2's 2006 Modeling Work Plan (MWP) and is based on the ECOM, SEDZLJS and RCATOX modeling codes provided to the CPG by Region 2 and a bioaccumulation model pursuant to Section 6 of the 2006 MWP<sup>1</sup>. Therefore, the basic framework of the working LPR/NB Model is consistent with the FFS Model, 2006 MWP and the RI/FS AOC.

CPG development of the LPR/NB Model framework has been shared with Region 2 over the last 5 years in many ways. One way was through formal EPA-CPG semi-annual and collaboration meetings as well as a series of meetings conducted since March 2013 to discuss specific aspects of the Sustainable Remedy (Attachment B). Eighteen such meetings have been held since July 2008. As discussed during our November 14 meeting, Hydroqual and the CPG modeling team (Anchor QEA and Moffat and Nichol) also have frequently conducted (i.e., weekly and monthly) working-level discussions that do not include the Region 2 or CPG project management team members.

The Region is correct in stating that there has not been a modeling collaboration meeting since February 2013; however, the CPG has made several attempts this calendar year to receive Region 2's direction and approval on the development of the LPR/NB Model and to resolve significant modeling issues identified by the CPG modeling team. There has been a significant amount of communication between EPA and the CPG on the modeling - both prior to and following the last formal collaboration meeting on February 28, 2013. There are four major areas in which the CPG has sought the Region's review and/or approval since January 9, 2013 and for which Region 2 has provided little to no input: (1) sediment transport modeling; (2) organic carbon simplification; (3) COPC mapping; and (4) model framework issues. Each of these issues, along with historical context where appropriate, is discussed below.

- 1. Sediment Transport Modeling The CPG has made changes to the sediment transport model. These changes were documented and provided to Region 2 for review and approval.
  - On January 9, 2013 a Sediment Transport Technical Memorandum along with code and input files were provided as part of the required RI/FS oversight of the LPR/NB model.
  - On April 8, 2013, Region 2 provided an initial set of comments and indicated additional comments would be forthcoming after Region 2's modeling team reviewed the outputs of the LPR/NB sediment transport model in more detail.



<sup>&</sup>lt;sup>1</sup> It is the CPG's understanding that Region 2 is not developing a bioaccumulation model for the FFS model and the Early Action FFS consistent with the requirements of the Region 2-approved 2006 MWP, but is using simple BSAFs for each COPC to estimate tissue concentrations.

S. Vaughn LPR Model Clarification November 22, 2013 Page 4 of 12

- No further communication from Region 2 has been received since then on the CPG's sediment transport model until the November 14 EPA-CPG Modeling when Region 2 representatives stated that the sediment transport model technical memorandum was not yet approved.
- **2. Organic Carbon Simplification** The CPG proposed simplifying the organic carbon model called for in Region 2's 2006 LPR Modeling Work Plan in a document submitted to Region 2 on January 29, 2010.
  - On June 23, 2010, Region 2 provided Dr. Dominic Di Toro's comments on the CPG's proposed modification to the organic carbon modeling for the LPRSA and NBSA.
  - On November 18, 2010 CPG provided responses to Region 2's comments.
  - During a February 3, 2011 EPA-CPG modeling meeting, Region 2 and the CPG agreed to have a follow-up conversation between Mr. Postma (CPG) and Dr. Di Toro (Region 2). A conference call took place on April 4, 2012 and a summary of the call and the mutually agreed modeling procedure was presented to Dr. Di Toro and Mr. Jim Fitzpatrick (HQI) on June 27, 2011 for review and approval.
  - In a September 14, 2011 email to Robert Law, Region 2 approved the organic carbon modeling simplification approach.
  - On May 15, 2012, Mr. Postma (on behalf of the CPG) submitted a memorandum describing the results and comparison of the agreed methodology for the organic carbon simplification.
  - On June 4, 2012, Mr. Fitzpatrick sent a response on behalf of Region 2 to the CPG May 15 memorandum stating that this approach could be implementable in the LPR and included a request for some additional tests and simulations.
  - During the September 24, 2012 EPA-CPG Modeling Collaboration Meeting, Mr. Postma presented the details of the implementation and the results of the requested tests and simulations by Region 2 and concluded that the approach was valid. During that meeting, Mr. Fitzpatrick had a question about the agreed-upon approach and thought that the methodology for the organic carbon in the bed was different.
  - On September 27, 2012 Mr. Fitzpatrick acknowledged via email that what Mr. Postma presented was the exact approach that had been agreed upon.
  - On April 13, 2013, the CPG submitted the Organic Carbon simplification code and inputs as requested by Region 2 for review and approval.
  - The CPG is awaiting Region 2 approval of the organic carbon code simplification.
- 3. COPC Mapping The CPG has on several occasions since 2011 presented to Region 2 its proposed approaches to developing both morphologic groupings and COPC



S. Vaughn LPR Model Clarification November 22, 2013 Page 5 of 12

mapping for the LPRSA to establish initial conditions for chemical fate and transport modeling.

- On September 7, 2011, the CPG presented its approach of the groupings based on sedimentation rates and bathymetric changes in a meeting between HQI and Moffatt and Nichol.
- On November 15, 2011, a more formal presentation (including the extension of the groupings to model initial conditions) was provided to Region 2 at the EPA-CPG Modeling Collaboration Meeting. The LPR mapping approach and 2,3,7,8-TCDD model initial conditions were shown in the CPG's presentation: "LPR Sediment Contamination Patterns and RCATOX Initial Conditions".
- On January 25, 2012, the Newark Bay mapping approach and initial conditions for 2,3,7,8-TCDD and Mercury were presented to Region 2 in the CPG's CFT Model update presentation at the EPA-CPG Modeling Collaboration Meeting.
- On March 22, 2012, PCB-77 initial conditions for LPR were presented to Region 2 in CPG CFT Model update presentation at the EPA-CPG Modeling Meeting.
- On June 11, 2012, the CPG presented the groupings once more to Region 2 (using its May 2012 SMWG presentation) at the EPA-CPG Model Collaboration Meeting.
- On February 28, 2013, CPG's refined mapping approach was raised with Region 2 as part of the CPG CFT model presentation: "Lower Passaic River Contaminant Fate & Transport Model – Status Report on Model Refinement Efforts" at the EPA-CPG Modeling Collaboration Meeting
- On March 5, 2013, as follow-up to the February 28 modeling meeting, the CPG reviewed its refined mapping approach with the Region 2 project team in a CPG presentation: "Surface Sediment 2,3,7,8 TCDD Concentrations in 1995 and 2012 Between River Miles 1-7 in the Lower Passaic River".
- On May 20, 2013, CPG submitted a memorandum on surface mapping to Region 2. To date, the CPG has not received a formal response from Region 2 on this memorandum; there has been some informal feedback but nothing substantive that the CPG could act upon.
- On September 26, 2013, the CPG's mapping approach was presented at length to Region 2 during the EPA-CPG Modeling Meeting conducted at the request of EPA Headquarters' OSWER office.
- **4. Model Framework Issues** The CPG has determined that issues related to sedimentation rate and bulk density differences exist between the sediment transport (SEDZLJS), organic carbon (ST-SWEM) and chemical fate and transport (RCATOX) models. There are inherent differences in each of these three modeling codes that are not the result of changes made to the modeling codes by the CPG or errors in the application of the models by the CPG.



S. Vaughn LPR Model Clarification November 22, 2013 Page 6 of 12

- On June 5, 2013, these issues were brought to the attention of Region 2 during an EPA-CPG meeting.
- In its July 23, 2013 letter, the CPG documented that the bulk densities that were being used by SEDZLJS, ST-SWEM and RCATOX were different, which would result in different sedimentation rates in the three component models. Specifically, RCATOX did not use the rates generated by SEDZLJS, which should be the only source of sedimentation rates in the modeling framework.
- For the September 26, 2013 EPA-CPG Modeling Meeting, the CPG was prepared to discuss this topic in detail and provide solutions to address the various sources of deposition rate mismatches within the model framework. However, time did not allow for such a discussion.
- As agreed during the September 26 meeting, the framework issues were going to be addressed in a teleconference/web meeting; however, due to the shutdown of the Federal government in early October this meeting did not occur.
- On October 11, 2013, the CPG provided its September 26 power point and a table summarizing the issues to Region 2. The CPG will be prepared to discuss these issues at any agreed upon date and time.

To date, other than initial comments on the LPR/NB Sediment Transport Model and initial approval of the organic carbon simplification approach, Region 2 has not provided any approval response or formal direction on the above matters. The CPG is hopeful that the series of modeling oversight meetings that Region 2 proposes in its October 23 letter will address the above-referenced issues and lead to completion of the LPR/NB model.

### Different Recovery Trajectories Using FFS and CPG Models

In Paragraph 6 of its letter, Region 2 states that it does not understand why the recovery trajectories produced by the FFS Model are markedly different than those produced by the CPG model. The CPG has identified these differences in the COPC mapping and modeling approaches in recent discussions with Region 2 which occurred on March 5, 2013, June 5, 2013, and September 26, 2013. Further, the CPG provided a detailed assessment of the FFS Model in its November 2012 comments to the National Remedy Review Board (NRRB). Many of the CPG's comments to the NRRB on the FFS Model were similarly raised in comments by EPA's own peer reviewers<sup>2</sup>.



<sup>&</sup>lt;sup>2</sup> See Report of the Peer Review Sediment Transport, Organic Carbon and Contaminant Fate and Transport – HQI September 2013 (hereinafter "Peer Review Report").

S. Vaughn LPR Model Clarification November 22, 2013 Page 7 of 12

While the LPR/NB Model is still a work in progress, it has overcome several limitations identified by the peer reviewers of the FFS Model in the Peer Review Report. These include, but are not limited to, the following.

- Infilling The working LPR/NB Model simulates infilling consistent with observations in the River. The CPG understands that the Region 2 modeling team is making changes to the FFS Model to address the concern raised by the Peer Review Report that the FFS Model did not demonstrate infilling consistent with observations in the River. This limitation with the FFS Model was previously identified in the CPG's November 2012 comments to the NRRB.
- Organic Carbon Although the CPG is still awaiting approval of the code, the working LPR/NB Model uses a simplified organic carbon approach approved by Region 2 and not the organic carbon model used for the FFS Model that was found by some of the FFS peer reviewers to be overly complex and not accurately reproducing actual data.
- Predicted Recoveries Region 2's peer reviewers considered the predicted COPC concentrations of sediment in the lower 8 miles provided by the FFS Model as:
  - Unrealistically low for both the Bank-to-Bank Full Dredge and the Bank-to-Bank Dredge and Cap alternatives being considered in the revised Early Action FFS.
  - Unrealistically high for the Monitored Natural Recovery alternative.

In sum, Region 2's peer reviewers concluded that the FFS Model both over-predicted the effectiveness of Region 2's FFS bank-to-bank alternatives and under-predicted the ability of the River to naturally recover.

By contrast, the working LPR/NB Model predicts the effectiveness of the remedial alternatives and pattern of natural recovery that is more consistent with expectations, given what is known about the system. The CPG understands that Region 2 is updating the FFS Model in response to peer review criticisms.<sup>3</sup> Once that effort is complete, the CPG fully expects the revised FFS Model to produce results closer to those of the working LPR/NB Model. In short, the CPG has developed the LPR/NB Model that is both consistent with the Region's 2006 Modeling Work Plan and FFS Model but with some modifications prompted by the CPG's own review as well as the peer review that have improved the LPR/NB Model.



<sup>&</sup>lt;sup>3</sup> The CPG believes that the December 2012 comments issued by the NRRB to the Region are also critical of the FFS Model and its predictions; however, to date Region 2 has exercised its prerogative and refused requests to release the NRRB comments to the CPG or other stakeholders.

S. Vaughn LPR Model Clarification November 22, 2013 Page 8 of 12

Another explanation for the differing recovery trajectories is the data used in each model. An important advantage of the working LPR/NB Model is that it is informed by all the data that have been collected for the RI/FS, in addition to the major historical data sets. The Region's failure to use all of the RI data to populate the FFS Model is a significant issue that critically impacts the results of the FFS Model. In its November 2012 NRRB submission, the CPG identified all the RI/FS data that the Region was not using to populate the FFS Model. Approximately one year later, the CPG still understands that the Region is not incorporating a significant amount of RI data into its FFS Model. The CPG continues to question Region 2's decision to not include recent, substantive data sets in the FFS Model. The CPG was directed by Region 2 to collect these data as part of the LPRSA RI/FS, and the data sets include extensive sampling in RM 0-8. Region 2 has, thus far, failed to consider the following data sets:

- 2009/2010 FSP 2 surface sediment grabs;
- 2012 SSP 1 data set;
- Portions of small volume and high volume Chemical Water Column data collected between August 2011 and June 2013; and,
- 2007, 2010, 2011 and 2012 Bathymetry Survey results; it is the CPG's understanding that Region 2 only relied upon the 2008 survey to develop its surface morphology region map used to map COPCs; and
- The recently completed SSP 2 data, which were collected in September and October 2013 and will be available over the next several months and incorporated into the LPR/NB Model.

Both SSP 1 and the recently completed SSP 2 data include some of the highest concentrations of 2,3,7,8-TCDD recorded in sediment outside of the immediate Lister Avenue area. These data provide a strong basis for the development of the CPG's-COPC mapping, support the target areas identified for removal in the Sustainable Remedy, and inform the working LPR/NB Model's recovery predictions.

Informed decisions about remedial alternatives for the River cannot be made when large amounts of LPRSA RI/FS data have been excluded from the FFS Model and from the evaluation of alternatives in the revised Early Action FFS. The CPG estimates that more than half (~55%) of the LPRSA surface sediment data collected between 2005 and 2012 by both Region 2 and the CPG have not been included in the FFS Model. That percentage will increase when the 2013 SSP2 samples are analyzed and the data validated. These same data have been identified by Region 2 as being critical, and Region 2 has specifically directed their collection at considerable cost.

The Region's failure to incorporate all of the RI data into the FFS Model has a significant impact on the remedial evaluation process. By considering all RI data collected



S. Vaughn LPR Model Clarification November 22, 2013 Page 9 of 12

(including data collected after 2011), the CPG has been able to refine its understanding of the River. That refined understanding has enabled the CPG to differentiate between areas of high concentration of contaminants and areas of lesser concentrations of contaminants and to design a more targeted remedial approach that can be accomplished more quickly, with less community disruption and at far less cost.

There is much inherent uncertainty associated with the feasibility and the effectiveness of any remedial alternative that is not based on all available data and to make remedial decisions without considering all data is both imprudent and is inconsistent with the National Contingency Plan (NCP).

## September 26, 2013 EPA-CPG Modeling Meeting

During the July 24, 2013 presentation that the CPG made to EPA Headquarters, EPA Headquarters directed Region 2 and the CPG to meet to determine why the two models were computing such different trajectories. A meeting of EPA and CPG representatives and other interested parties was subsequently held on September 26, 2013 for this purpose.

In Paragraph 7 of its October 23 letter, Region 2 states that it expected the September 26th meeting to concern the Targeted Remedy Model, but that the CPG viewed it as an EPA/CPG 17-mile RI/FS Model collaboration meeting. The last sentence of the paragraph states:

"The information discussed is critical for the development of the 17-mile RI/FS Model, but the level of detail presented during the meeting is not needed to answer the relatively simple charge from EPA Headquarters of determining why the Targeted Remedy Model and the FFS Model are producing different results."

The CPG does not view the Headquarters charge so narrowly and has taken very seriously the direction by Headquarters to work with Region 2 to understand the differences in the Region 2 and CPG model results. Since, as discussed herein, there is no separate Targeted Remedy Model, it was important to present to Region 2 the details of the working LPR/NB Model and to understand the Region 2 FFS Model. While the CPG modeling team understands the differences between the respective Region 2 and CPG model application, in order to truly reconcile those differences in a manner consistent with Headquarters' charge, the CPG needs to also fully understand the details of the approach Region 2 was using in its FFS Model. As evidenced during the November 14 meeting, there are still aspects of the FFS Model and the FFS remediation

S. Vaughn LPR Model Clarification November 22, 2013 Page 10 of 12

scenarios that the CPG has not been fully informed about by the Region and its modeling team.

For example, there were a few important outcomes from the September 26<sup>th</sup> meeting:

- The CPG modelers learned that the EPA and the CPG view the physical structure of the River in a similar way.
- Understanding this similarity highlights the impact on the FFS Model that results from the Region's failure to use all of the available surface sediment data collected through 2012; and
- The CPG better appreciates the significance of Region 2 not using all of the RI
  sediment data in the development of COPC mapping for initial conditions.
  Although both the Region and the CPG appear to view the River similarly on a
  physical basis, the Region's decision to exclude a large percentage of the
  sediment chemistry data results in a very different, and incorrect, distribution of
  contaminants in the sediment.

## **Modeling Meetings**

The CPG agrees with the meeting schedule that EPA proposes in its October 23, 2013 letter. The CPG believes the November 14 EPA-CPG meeting was successful. The CPG supports the goal of having regular and focused modeling oversight meetings starting in January 2014 so that Region 2 and its modeling team can continue to provide oversight and review the development and implementation of the LPR/NB Model.

As a result of the November 14 meeting, the CPG hopes that Region 2: (1) has a better understanding of the CPG's Sustainable Remedy; (2) agrees that there are more similarities than differences in the development of the FFS and LPR/NB models; and (3) how results of the working LPR/NB modeling provide a meaningful comparison of Region 2's FFS alternatives and the CPG's targeted removal.

It is clear that both the EPA and CPG modeling teams believe that the FFS and LPR/NB sediment transport model implementations are converging to a single model. The November 14 discussion also suggests that the current differences between the CFT applications in the FFS and LPR/NB models can be resolved in the oversight meetings planned for early next year. Thus, it should not be long before a single consensus model can be developed and used by both Region 2 and the CPG. By understanding our differences in approaches – at a detailed level - the CPG can better work with EPA to develop the LPR/NB Model that is based on a common understanding of the River.



S. Vaughn LPR Model Clarification November 22, 2013 Page 11 of 12

Please include this letter and all the attachments in the administrative record for the LPRSA RI/FS Operable Unit of the Diamond Alkali Superfund Site. While you already have the additional attachments, copies are being provided under separate cover for ease of reference and inclusion in the administrative record.

Please contact Bill Potter or me to discuss.

Very truly yours, de maximis, inc.

Robert Law, Ph.D. CPG Project Coordinator

cc: Walter Mugden, EPA Region 2
Ray Basso, EPA Region 2
Eugenia Naranjo, EPA Region 2
Alice Yeh, EPA Region 2
Jim Woolford, EPA HQ
Steve Ells, EPA HQ
Earl Hayter, USACE
Marc Greenberg, EPA HQ
CPG Members
William Hyatt, CPG Coordinating Counsel

Willard Potter, de maximis, inc.

### Attachments included with this letter

- (A) USEPA Region 2's (Stephanie Vaughn) Letter to CPG (Robert Law); dated September 23, 2013
- (B) History of Interactions with EPA on the LPR/NB Model, EPA-CPG Modeling Meeting (Power Point Presentation presented by CPG at EPA-CPG Modeling November 14, 2013 Meeting)

S. Vaughn LPR Model Clarification November 22, 2013 Page 12 of 12

## Additional Attachments (to be provided under separate cover)

- September 2006. Final Modeling Work Plan, Lower Passaic River Restoration Project, Hydroqual.
- 2008 to 2013. EPA-CPG Modeling Meeting Agendas
- November 2011 CPG Presentation: "LPR Sediment Contamination Patterns and RCATOX Initial Conditions"
- January 2012. CPG CFT Model update presentation at the EPA-CPG Modeling Collaboration Meeting
- March 2012. CPG CFT Model update presentation at the EPA-CPG Modeling Meeting
- May 2012. Estuarine Dynamics and Contaminant Distribution Patterns in the Lower Passaic River Study Area, SMWG Presentation, Mathew et al.
- February 2013. CPG CFT model presentation: "Lower Passaic River Contaminant Fate & Transport Model Status Report on Model Refinement Efforts"
- September 2012. Focused Feasibility Alternatives Passiac River Lower 8 Miles CAG Meeting (Power Point Presentation presented Region 2 at September 18, 2012 CAG Meeting)
- November 2012. Comments of the Lower Passaic River Study Area Site Cooperating Parties Group for the National Remedy Review Board, K&L Gates, November 21, 2012
- March 2013. CPG presentation: "Surface Sediment 2,3,7,8 TCDD Concentrations in 1995 and 2012 Between River Miles 1-7 in the Lower Passaic River"
- May 2013. Lower Passaic River Surface Sediment Concentration Mapping memorandum. Anchor QEA
- July 2013. Model Development Lower Passaic River Study Area (LPRSA) Remedial Investigation/ Feasibility Study (RI/FS) -CERCLA Docket No. 02-2007-2009 (CPG Letter (Robert Law) to Region 2 (Stephanie Vaughn and Eugenia) date July 23, 2013.
- July 2013. A Sustainable Remedy for the Lower Passaic River (Power Point Presentation presented on July 24, 2013 by CPG to EPA HQ OSWER)
- September 2013. Report of the Peer Review of Sediment Transport, Organic Carbon, and Contaminant Fate and Transport Lower Passaic Rover Lower Eight Mile Focused Feasibility Study, HQI.

## ATTACHMENT A



## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 2 290 BROADWAY NEW YORK, NY 10007-1866

October 23, 2013

Robert H. Law, Ph.D. de maximis, inc. 186 Center Street, Suite 290 Clinton, New Jersey 08809

Dear Dr. Law:

As you know, three models are currently being developed to support the remedial investigations and feasibility studies being conducted for the Lower Passaic River Study Area (LPRSA), as part of the Diamond Alkali Superfund Site.

First, the U.S. Environmental Protection Agency (EPA) is developing a model to support the Focused Feasibility Study for the lower 8-miles of the LPRSA (the "FFS Model"). Second, the Cooperating Parties Group (CPG) is developing a model for the entire 17-mile stretch of the LPRSA plus Newark Bay (the "17-mile RI/FS Model"). This model is being developed under EPA oversight pursuant to Administrative Order on Consent, CERCLA Docket No. 02-2007-2009, and it uses the FFS model as a starting point. Finally, the CPG has developed a model to support their targeted remedy approach, as presented to EPA Headquarters on July 24, 2013 (the "Targeted Remedy Model").

During our meetings and discussions, it is important to keep these three models distinct, as each has a different focus and is being developed with different levels of oversight.

The CPG is developing the 17-mile RI/FS Model with EPA oversight in order to support remedy selection for the full 17-mile LPRSA. EPA and the CPG have formal collaboration meetings to discuss the model development in a methodical way (though there has not been a formal meeting since February) and there is also relatively open communication between our modeling teams outside of meetings. To date, our discussions have still been focused primarily on the sediment transport portion of the model; we have not yet devoted much time to discussing the contaminant fate and transport portion of the model or the inputs to the model.

On the other hand, while they are still being refined, both EPA's FFS Model and the CPG's Targeted Remedy Model are being used to create trajectories which show how concentrations of contaminants of concern will decline over time in the river after various remedial options are taken. Presumably, the Targeted Remedy Model is based on the portions of the 17-mile RI/FS Model that we have already discussed, but it goes well beyond where we have provided oversight.

The trajectories produced by the FFS Model are markedly different than those produced by the Targeted Remedy Model, and these differences were highlighted during the July 24, 2013

presentation the CPG made to EPA Headquarters. Since the Targeted Remedy Model was developed without EPA oversight, EPA does not know why the trajectories produced by the two models are so different. As such, EPA Headquarters directed our office to determine why the two models are computing such different trajectories, separate and apart from the model collaboration process.

In response to this request, the CPG proposed a series of six meetings to discuss the model in detail. The first of these meetings was held on September 26, 2013. While EPA understood this meeting to concern the Targeted Remedy Model, the CPG apparently viewed it as an EPA/CPG 17-mile RI/FS Model collaboration meeting. By the end of the meeting, two things became clear. First, the information that was discussed – how the sediment data are interpolated for use in the model – is critical to the model development and, second, for the purposes of understanding why the Targeted Remedy Model trajectories differ from those of the FFS Remedy Model, the meeting could have been much shorter. The information discussed is critical for the development of the 17-mile RI/FS Model, but the level of detail presented during the meeting is not needed to answer the relatively simple charge from EPA Headquarters of determining why the Targeted Remedy Model and the FFS Model are producing different results.

Given this situation, and as we discussed on October 21, 2013, we propose the following:

- Schedule a single meeting in the next two to three weeks during which the CPG will present all of the assumptions/decisions they have made in the development of their Targeted Remedy Model which they think set it apart from EPA's FFS Model. Presumably, these are the differences that the series of six meetings were going to elaborate on but, for the purpose of determining why the two models differ, a simple explanation will suffice. EPA will not provide input during this meeting; it will be held for informational purposes only.
- Over the next two to three months, regularly schedule each of the remaining five meetings proposed by the CPG, as part of the 17-mile RI/FS Model collaboration process. The proposed meetings provide a good framework for moving this process forward and staying on schedule to have the RI/FS complete by 2015. We imagine that additional, or at least follow-up, meetings will be needed once these are underway, but they will provide a good starting point.

Please let me know if you have any questions or concerns.

Sincerely yours,

Stephanie Vaughn, Project Manager

LPRSA 17-Mile RI/FS

cc: R. Basso

E. Naranjo

A. Yeh

## **ATTACHMENT B**

## History of Interactions with EPA on the LPR/NB Model

November 14, 2013 EPA/CPG Meeting

## **CPG – EPA Modeling Interactions Overview**

- The CPG is charged with the development of the LPR/NB model in support of the RI/FS
  - Details are specified in the EPA/HQI Modeling Workplan (2006), including the use of the CARP model framework
- EPA Region 2 has an oversight role in the model development
- Modeling interactions have been ongoing since ca 2008:
  - Formal meetings
  - Conference calls on specific topics
  - Emails and other correspondence
  - CPG document submissions
  - Code transmittals

## **CPG – EPA Modeling Interactions Formal Meetings**

- To date, there have been at least 18 formal meetings on LPR/NB model development:
  - "Semi-Annual Modeling Meetings"
    - July 2008, March 2009, Dec 2009, June 2010, Feb 2011, Nov 2011
  - "Model Collaboration Meetings"
    - Apr 2011, May 2011, July 2011, Sep 2011, Jan 2012, March 2012, Jun 2012, Sept 2012, Feb 2013
  - Several additional meetings on specific topics; most recently
    - March 2013 (COPC Mapping)
    - June 2013 (Initial Projection Results; Deposition Rate Mismatches)
    - Sept 2013 (COPC Mapping)
    - Today (Overview of LPR/NB Model Development)

## **CPG – EPA Modeling Interactions Hydrodynamic/Sediment Transport Model**

- Major topics and meeting dates
  - LPR ST system understanding June 2010
  - Initial ST model application (short term, high and low-flow) –
     Nov 2011
  - Bathymetry analysis June & Sep 2012
  - Extended ST model application (long-term) June 2012
- Documents/codes/inputs submitted
  - ST model development and calibration status memo, code and inputs – J a n2013

# **CPG – EPA Modeling Interactions Organic Carbon Simplification**

- Overview of meetings and topics, documents/codes/inputs submitted
  - Initial presentation on OC simplification M a r c 2009
  - Formal proposal on OC simplification J a n2010
    - Several follow-up conversations and documentation 2010 through 2011
  - EPA approval of OC simplification − S e p 2011
  - CPG memorandum on implementation of OC simplification –
     May 2012
  - CPG presentation on implementation of OC simplification –
     Sept 2012
  - OC simplification codes & inputs transmittal to EPA A p r2013

## **CPG – EPA Modeling Interactions Contaminant Fate & Transport Model**

- Overview of meetings and topics
  - COPC Mapping
    - Initial approach (groupings and IDW interpolation) − N o √2011 and Jan 2012
    - Revised approach (adjusted groupings and Thiessen interpolation) –
       Feb 2013, March 2013, and Sept 2013
  - CFT Model Development
    - Initial long-term runs and application to first CWCM event Jan 2012
    - Initial projection application (MNR) March 2012
    - Tests to debug/reduce tidal pumping loss Sept 2012
    - Assessing boundary conditions with CWCM data S e p ₹012
    - Overview of model refinements & calibration approach F e b2013
    - Initial projection results & mismatches in net sedimentation rate –
       June 2013

## **CPG – EPA Modeling Interactions Contaminant Fate & Transport Model**

- Documents submitted
  - Memorandum on initial CWCM data analysis May 2013
  - Memorandum on revised CPG COPC mapping approach May 2013
  - Presentation and summary table on inconsistencies in net sedimentation rates within the LPR/NB Model Framework
     Oct 2013

## **CPG – EPA Modeling Interactions Code/Input Transmittals from EPA/HQI**

- Most recent code transmittals from EPA/HQI include
  - HST Model
    - Code: Nov 2011
    - ST Inputs: Nov 2011
    - Full-grid HD Inputs: Nov 2013
  - CFT Model
    - Codes: April 2012
      - Revised dredging module in Feb 2013
    - Inputs: Sept 2013
      - Remediation info (worksheets) in March 2013